

REMARKS

Claims 12-14, 17-22 and 25-33 are presented for examination.

In the Final Rejection of September 22, 2003, the title was objected to; the substitute specification, on page 10, was objected to; and claims 12-14, 17-22 and 25-29 were rejected under 35 USC 103(a) as being unpatentable over EP 0 869 701 (Kanai et al).

By this amendment, the title has been amended to be more descriptive; the portion on page 10 of the substitute specification has been amended, as suggested by the Examiner; claim 29 has been amended to further highlight the invention over the prior art and claims 30-33 have been added.

With regard to the addition of newly-presented claims 30 and 31, it is noted that the substitute specification, on page 6, in the paragraph starting at line 18 states that the charge carrier injection layer can also be quasi-integrated into the top electrode, into the uppermost organic function layer or into an electron transport layer. Thus, it is submitted that the subject matter of newly-presented dependent claim 30 and independent claim 31 is clearly supported by the specification as originally filed and that these claims do not involve any new matter.

In rejecting claim 29 and the claims dependent thereon, the Final Rejection states that one of ordinary skill in the art could derive complex metal salts recited in claim 29 from the general formula $A_pM_qX_r$ of Kanai et al for complex halide compounds of cathode interface layers, wherein A is selected from the metal elements of Group 1A and 2A of the Periodic Table, M is selected from metal elements of Groups 3A and 3B and X is a halogen atom and p, q and r are all integers running independently of one another.

The general formula AMX from Kanai et al teaches metal hydrides for the cathode interface layer, wherein alkaline and alkaline earth metals, which include Li, Na, K, Rb, Cs, Be, Mg, Ca, Sr and Ba, for the A position of the formula and the M position would be Sc, Y, La, Lu, B, Al, Ga, In and Tl. It is submitted that as now amended, none of the eight complex metal salts could be obtained from the general formula of the reference, because the second M constituent would need to be a repeat of one of the A constituents or silver, so that a person skilled in the art would need additional teachings in order to modify the general

formula to make it A, A, X. Thus, it is submitted that both independent claims 29 and 31 are clearly not obvious in view of the general formula and, thus, are not obvious in view of the teachings of the reference.

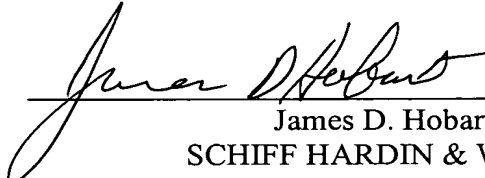
It is also noted that Kanai et al lists specific examples of a complex metal halide containing heavy atoms like bromine and iodine (column 11, lines 15-48). These complex metal halides are believed to be luminescence quenchers, due to the heavy atom effect mediated by bromine and/or iodine, and are, therefore, not suitable as a cathode interface layer. It is well-known in the art that these heavy atoms, especially iodine and bromine, can cause a spin-orbital-coupling, which enables a relaxation of the excited singlet state back into the ground state without emitting radiation. This leads to a quenching effect, which would reduce the luminescence of the OLEDs with cathode interface layers made out of these materials. Due to this fact, we believe that a large part of the explicitly-mentioned complex metal halides in Kanai et al cannot be used as cathode interface layers in organic luminescent devices and that it would be obvious to a person of ordinary skill in the art that a large part of the invention disclosed in Kanai et al cannot be carried out properly. Therefore, an expert in the technical field of OLED would be skeptical about the prospects of success concerning the use of a large part of the complex metal halides disclosed as specific working embodiments in the reference. Since a person of ordinary skill in the art would be skeptical of using these, he would surely not follow the teachings of Kanai et al by trying to use these metal halides being disclosed by a general formula only for cathode interface layers. Instead, he would try to develop a new complex metal halide independent from Kanai et al, like the compounds of the present invention.

It is also noted that Al is the only element in the M position that can be used in applicants' formula. Thus, it is submitted that Kanai et al only provides an invitation to experiment and does not teach applicant's solution.

For these reasons, it is respectfully submitted that independent claims 29 and 31 and dependent claims 12-14, 17-22, 25-28, 30, 32 and 33 are clearly patentable over the teachings of the reference and are allowable.

In view of the amendments and explanations contained hereinabove, it is respectfully submitted that this application is now in condition for immediate formal allowance and consideration to that end is earnestly solicited.

Respectfully submitted,

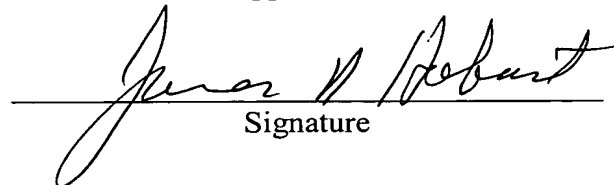
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DATED: November 20, 2003

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Signature

November 20, 2003
Date